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NOTES ON THE AMPHIUMA.

BY HENRY C. CHAPMAN, M.D.

On looking over general works, like those of Owen, Huxley, Milne Edwards, Gegenbaur, Stannius, etc., in reference to the anatomy of the Perrenibranchiate Batrachia, I find that the *Amphiurma* is only referred to in a general way, and, with the exception of Cuvier's memoir,¹ I do not know of any special paper having been published on the structure of that animal. Having dissected the *Amphiurma* that recently died at the Zoological Garden, I thought that it might not be uninteresting to notice the disposition of its internal organs. The specimen was a male, and measured twenty-nine inches. As regards the alimentary canal, the only difference that I noticed in my specimen, as compared with that described by Cuvier, was that the rectum did not exhibit the constrictions seen in the figure of his specimen. In other respects, such as the longitudinal folds of the stomach, the openings into the cloaca, etc., they were alike. The liver and spleen were large, and there was a distinct pancreas. The lungs were well developed, and attained a length of thirteen inches, which may serve to explain the fact of the animal being able to remain under water such a length of time. The heart differs from that of the siren in that the auricles are not fringed to the same extent. The ventricle is large and muscular, and is separated from the bulbus arteriosus by a short and narrow constriction. The bulbus bifurcates each branch at once, then subdivides into the pulmonary artery and a branchial vessel. The latter winds around the pharynx, and, meeting its fellow of the opposite side, the two form the aorta. From the branchial vessel are given off cephalic and hyoid branches. The blood is returned from the lung to the heart by a pulmonary vein. As compared with *Siredon*, *Menobanchus*, *Siren*, *Proteus*, and even with the closely allied *Menopoma*, *Amphiurma* exhibits a very simple and concentrated type of circulation. I did not notice anything peculiar about the branches given off by the aorta, which I examined through its length; the vessels supplying the Wolffian bodies were large. The bladder

¹ Cuvier Memoires du Musée. 2 op. cit., pl. 1, fig. 2, tome 14th.

was long and narrow, measuring nine inches: it opened into the cloaca. I can only account for the great length of the bladder in the *Amphiuma* and *Siren* on the supposition that it represents a sort of rudimentary allantois. This view is strengthened by the fact of the *Amphiuma* having very simple limbs, and in this respect also foreshadowing higher types of life. The uro-genital apparatus in its general arrangement resembles that of the newt (*Triton teniatus*). The testicle, however, was undivided, and measured five and a half inches in length; it was situated in the posterior third of the body cavity. From the testicle six or seven efferent ducts pass transversely outward to the remains of the upper part of the Wolffian body, represented by a chain of dilations. From this embryonic remnant pass about twelve tubes into a common uro-genital duct, which measures nine inches. This duct runs in a wavy course until it reaches the lower part of the Wolffian body, or the so-called kidney. Here the duct becomes straight, and lies on the outside of the Wolffian body, from which it collects, through small tubes, the urine. This common uro-genital duct opens into the cloaca posteriorly to the bladder. I was able by pressing upon the duct to squeeze a considerable amount of semen through its opening into the cloaca, which gave me the opportunity of examining the spermatozoa. These bodies did not exhibit a very well defined head, but one end was obtuse and the other tapered off tail-like. Just between the cloaca and abdominal wall I found coiled up a nematoid worm, which may be the *Ascaris unguiculata*. I found what seemed to be also the same worm in an encysted condition in the intestine and in the mesentery.